UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

Note to Reader
September 9, 1998

Background: As part of its effort to involve the public in the implementation of the Food Quality Protection Act of 1996 (FQPA), which is designed to ensure that the United States continues to have the safest and most abundant food supply, EPA is undertaking an effort to open public dockets on the organophosphate pesticides. These dockets will make available to all interested parties documents that were developed as part of the U.S. Environmental Protection Agency's process for making reregistration eligibility decisions and tolerance reassessments consistent with FQPA. The dockets include preliminary health assessments and, where available, ecological risk assessments conducted by EPA, rebuttals or corrections to the risk assessments submitted by chemical registrants, and the Agency's response to the registrants' submissions.

The analyses contained in this docket are preliminary in nature and represent the information available to EPA at the time they were prepared. Additional information may have been submitted to EPA which has not yet been incorporated into these analyses, and registrants or others may be developing relevant information. It's common and appropriate that new information and analyses will be used to revise and refine the evaluations contained in these dockets to make them more comprehensive and realistic. The Agency cautions against premature conclusions based on these preliminary assessments and against any use of information contained in these documents out of their full context. Throughout this process, if unacceptable risks are identified, EPA will act to reduce or eliminate the risks.

There is a 60 day comment period in which the public and all interested parties are invited to submit comments on the information in this docket. Comments should directly relate to this organophosphate and to the information and issues

available in the information in this docket. Once the comment period closes, EPA will review all comments and revise the risk assessments, as necessary.

These preliminary risk assessments represent an early stage in the process by which EPA is evaluating the regulatory requirements applicable to existing pesticides. Through this opportunity for notice and comment, the Agency hopes to advance the openness and scientific soundness underpinning its decisions. This process is designed to assure that America continues to enjoy the safest and most abundant food supply. Through implementation of EPA's tolerance reassessment program under the Food Quality Protection Act, the food supply will become even safer. Leading health experts recommend that all people eat a wide variety of foods, including at least five servings of fruits and vegetables a day.

Note: This sheet is provided to help the reader understand how refined and developed the pesticide file is as of the date prepared, what if any changes have occurred recently, and what new information, if any, is expected to be included in the analysis before decisions are made. **It is not meant to be a summary of all current information regarding the chemical.** Rather, the sheet provides some context to better understand the substantive material in the docket (RED chapters, registrant rebuttals, Agency responses to rebuttals, etc.) for this pesticide.

Further, in some cases, differences may be noted between the RED chapters and the Agency's comprehensive reports on the hazard identification information and safety factors for all organophosphates. In these cases, information in the comprehensive reports is the most current and will, barring the submission of more data that the Agency finds useful, be used in the risk assessments.

Jack Housenger, Acting Director
Special Review and Reregistration
Division

November 8, 1996

Memorandum

SUBJECT: EFED RED Chapter for Tribufos

FROM: Mary Powell
Science Analysis and Coordination Staff
Environmental Fate and Effects Division (7507C)

THRU: Kathy Monk, Acting Chief
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TO: Margaret Rice, PM 53
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Special Review and Reregistration Division (7508W)

Attached please find the following documents for the completed RED for tribufos:

1. Summary report
2. Integrated EFED RED chapter
3. EFGWB science chapter
4. EEB science chapter

There are numerous LOC exceedances for this chemical and several data gaps. These and other issues are discussed in the following summary report.

If you have any questions about this case, please call Mary Powell on 305-7384.

RED Summary Report

I. Introduction

Tribufos is a defoliant used to remove leaves from cotton plants prior to anticipated harvesting. The maximum application rate is 1.875 lb ai/acre. It is applied preharvest by spray (aircraft and ground) and ultra low volume (aircraft and ground).

The environmental fate of tribufos has been well characterized in the laboratory, though its behavior in the field is not yet clearly understood. Based on laboratory data, tribufos is persistent and immobile, thus the possibility exists that tribufos will accumulate in soil with repeated applications. The primary route of dissipation appears to be anaerobic metabolism under flooded conditions, with a half-life of 4-6 months. Tribufos is stable to hydrolysis, photodegradation, and aerobic soil metabolism. It is only moderately soluble in water and has a fairly low vapor pressure.

Tribufos binds to soil and is, therefore, not expected to leach to ground water or move to surface water through dissolved runoff. Freundlich K_{ads} values ranged from 61-106 in sand, sandy loam, silt loam, and clay loam soils. K_{oc}s ranged from 4870-12684. Aged tribufos residues were also not mobile, with 90-99% of the applied remaining in the 0-6 cm layer of the soil columns.

Tribufos can contaminate surface water at application by spray drift. Substantial fractions of applied tribufos may remain available for runoff for many months post-application. The relatively high soil/water partitioning of tribufos indicates that runoff will generally occur primarily via adsorption to eroding soil as oppossed to dissolution in runoff water. In addition, the concentration of tribufos adsorbed to suspended and bottom sediment will be much greater than its concentration in sediment pore water or the water column.

Data on fish accumulation have shown that tribufos has a low potential to bioaccumulate in bluegill sunfish. Bioconcentration factors were 300X, 1300X, and 730X for edible tissues, nonedible tissues, and whole fish, respectively. Tissue residues decreased rapidly during the depuration period with 71-88% of the radioactivity eliminated after 14 days.

II. Summary of Toxicity

The available acute toxicity data on the TGAI indicate that tribufos is practically nontoxic to moderately toxic to birds (LD50s: 151 - 2,934 mg/kg; LC50s: 1519 - > 5000 ppm), moderately toxic to small mammals (LD50: 192 - 235 mg/kg), practically nontoxic to bees (LD50: > 24.17 µg/bee), very highly toxic to moderately toxic to freshwater organisms (LC50s: 0.027 ppm - 2.100 ppm), and very highly toxic to highly toxic to estuarine/marine organisms (LC50 or EC50: 0.0046 to 0.767 ppm). Chronic toxicity studies established the following NOEC values: 148 ppm for bobwhite quail; 32 ppm for small mammals; 1.56 ppb for freshwater invertebrates; and < .34 ppm for estuarine/marine invertebrates.

Nontarget terrestrial plant toxicity data are lacking; most nontarget aquatic plant toxicity data are lacking. However, data are available on a freshwater green alga (*Kirchneria subcapitata*) and a marine diatom (*Skeletonema costatum*): EC50s = 0.148 ppm and 0.370ppm, respectively.

III. Summary of Risk

A table of risk quotients (RQs) may be found on the following page, "Summary of Risk Quotients for Tribufos."

Acute risks to nonendangered birds are not likely (RQ, = .1-.3); any potential acute risks may be mitigated by restricted use classification. Chronic risks are likely (RQ = 1.03-3.04), but the probability of whether they will occur is difficult to assess.

Acute and chronic risks are likely for small mammals. Chronic risks present the highest RQ (6.38-13.94), and the certainty of this assessment is high; acute RQs range from .01-2.23 and the certainty of this assessment is moderate to high.

Aquatic risk assessments are based on exposure scenarios from three states: California, representing a dry climate; Mississippi, representing a wet climate; and Texas, a mixed climate:

- In the California scenario, acute risks to freshwater vertebrates (RQ = 0) and invertebrates (RQ = .01) are not likely. Chronic risks for freshwater invertebrates (RQ = .05) are also unlikely; chronic effects data for freshwater fish are lacking. Use of tribufos in California is not expected to affect estuarine/marine environments.

- In the Texas scenario, acute risks to freshwater vertebrates are not likely (RQ = .03). A chronic risk characterization for freshwater fish is not possible; chronic effects data are lacking. Acute risks to freshwater invertebrates (RQ = .3) may be mitigated by restricted use classification; however, chronic risks to these organisms is likely (RQ = 1.5). Endangered freshwater invertebrates are likely to be affected acutely and chronically. Acute risks to nonendangered estuarine/marine fish are not likely (RQ = .06); however, endangered estuarine/marine fish may be affected acutely. A chronic risk characterization for estuarine/marine fish is not possible; chronic effects data are lacking. Acute (RQ = 1.6) and chronic (RQ = 10) risks to estuarine/marine invertebrates, including endangered species, are likely.

- In the Mississippi scenario, endangered freshwater fish may be acutely affected. However, a chronic risk characterization for freshwater fish is not possible; chronic effects data are lacking. Acute risks to estuarine/marine fish (RQ = .11) may be mitigated by restricted use classification; however, endangered fish may be affected acutely. A chronic risk characterization for estuarine/marine fish is not possible; chronic effects data are lacking. Acute and chronic risks to freshwater

invertebrates (RQ = .52 and 3.5, respectively) and estuarine/marine invertebrates (RQ = 2.8 and 23.33, respectively), including endangered species, are likely.

IV. Data Gaps

A. Ecological Effects

EFED is able to complete a partial risk characterization of tribufos using the present toxicity data. The following additional data would increase the certainty of the risk assessment:

1. **An avian reproduction study using mallard duck (71-4(b))**: Submission of this study would have a medium value since EFED was able to complete a chronic characterization for birds using the bobwhite quail reproduction study. However, submission of the mallard study would reduce uncertainty in the risk assessment since it is not known how different avian species would respond to tribufos under chronic exposure conditions.

2. **A freshwater fish early life-stage study (rainbow trout, preferred species; 71-4(a))**: Submission of this study would have a high value since EFED was unable to characterize chronic risks to nontarget fish. The available aquatic chronic data are for invertebrates only, but indicate adverse effects on aquatic invertebrate reproduction occur. Further, the available data indicate: (1) tribufos is likely to be persistent in nontarget waters (hydrosoil) because the parent is stable to hydrolysis, photolysis, and aerobic soil metabolism and ; (2) tribufos has adverse effects on avian and mammalian reproduction (in addition to aquatic invertebrate reproduction); and (3) tribufos is used in areas that may impact nontarget waters.

3. **An estuarine/marine fish early life-stage study (sheepshead minnow, preferred species; 71-4(a))**: Whether this study would be required depends on the results of the freshwater fish early life-stage study and comparisons with aquatic EECs.

4. **An estuarine/marine invertebrate life cycle study (mysid, preferred species; 71-4(b))**: Submission of this study would have a medium value since EFED does have a mysid life-cycle study (but one without an established NOEC) for use in characterizing chronic risks to estuarine/marine invertebrates. Submission of a new study would reduce uncertainty in the risk assessment. Further, the available chronic aquatic invertebrate data indicate adverse effects on reproduction and aquatic EECs (Texas and Mississippi) are well above effect levels. In addition, the available data indicate: (1) tribufos is likely to be persistent in nontarget waters (hydrosoil) because the parent is stable to hydrolysis, photolysis, and aerobic soil metabolism; (2) tribufos has adverse effects on avian and mammalian reproduction

(as well as on daphnid and mysid reproduction); and (3) tribufos is used in areas that may impact nontarget waters.

5. **Nontarget terrestrial plant studies (123-1(a) and (b))**: Submission of these studies would have a high value since EFED is unable to characterize risks to nontarget terrestrial plants. Tribufos is a defoliant that defoliates targeted plants. Further, it is applied aerially and is persistent in the environment. These factors provide for exposure of nontarget terrestrial plants.

6. **Nontarget aquatic plant studies (123-2)**: Vascular plants (*Lemna gibba*): Submission of this study would have a high value since EFED is unable to characterize risks to nontarget vascular plants. Submission of this study would reduce uncertainty in the risk assessment since it is not known how aquatic vascular plant species would respond to tribufos. Further, tribufos is applied aerially and is persistent in the environment. These factors provide for exposure of nontarget aquatic plants.

B. Environmental Fate and Ground Water

All environmental fate data requirements have been fully satisfied, except for Terrestrial Field Dissipation (164-1) and Spray Drift (201-1, 202-1).

- **!** Two field dissipation studies were submitted and reviewed; however, both were found to be of questionable scientific validity. In addition, it was not clear what the route of dissipation was in the two studies. Both studies showed a rapid decline in residues, which cannot be explained, given the information provided by the laboratory studies. The laboratory studies show that tribufos is very stable to both chemical and microbial degradation. Other possible routes of dissipation, including accumulation in plants, volatilization, and leaching, are also not supported by the laboratory data. While it is not unusual to observe faster degradation in the field compared with the laboratory, the differences seen here were not justified.

  New studies are required to define the behavior of tribufos under actual field conditions.

- **!** Spray Drift data requirements were imposed due to the phytotoxic nature of tribufos and its method of application. The registrant, Miles Inc., is a member of the Spray Drift Task Force, and may elect to satisfy these requirements through the Task Force.

V. Endangered Species

Endangered species LOCs are exceeded for birds (single and multiple applications), mammals (single and multiple applications), freshwater fish (Mississippi scenario), freshwater invertebrates (Texas and Mississippi scenarios), and estuarine/marine fish and invertebrates (Texas and Mississippi scenarios).

The Endangered Species Protection Program is expected to become final in the future. Limitations in the use of tribufos may be required to protect endangered and threatened species, but these limitations have not been defined and may be formulation specific. EPA anticipates that a consultation with the Fish and Wildlife Service may be conducted in accordance with the species-based priority approach described in the Program. After completion of consultation, registrants will be informed if any required label modifications are necessary. Such modifications would most likely consist of the generic label statement referring pesticide users to use limitations contained in county Bulletins.

VI. Risk Characterization

Tribufos is unique for several reasons: It is an organophosphate compound used as a defoliant (alone and tank mixed with other chemicals), it is unusually persistent, and it is applied in the fall.

According to information provided by BEAD, the use of tribufos has been rising from 1991 - 1994. In 1991, it was probably applied to more than 1 million acres, or <10% of planted acreage. In 1994, tribufos was applied to 4 million - 5 million acres, or about 30% - 35% of planted acreage. Usually, one application of tribufos is made at a rate of <1 lb ai/A; occasionally, two applications are made.

A major concern with tribufos is chronic risk because it is immobile and unusually persistent. However, EFED's assessment and characterization of the chronic risk from this chemical is incomplete. Crucial data are missing on field dissipation, freshwater and estuarine/marine fish early-life-stage toxicity, and toxicity to non-target plants. Tribufos is applied in the fall -- outside the breeding season for birds and aquatic species -- so the data are particularly important to understanding possible exposures to avian and aquatic species in the spring.

Though data are not available to support this, EFED believes that in some areas of the country, tribufos is applied mostly by aircraft. This is because the wheels of the ground equipment used to apply tribufos can damage the mature cotton plants and the wet soil may not be firm enough to support the equipment. The application method is important because some labels for tribufos already carry warnings to avoid contaminating surface water via aerial applications.

Mitigation measures for both acute and chronic risk are proposed below. Because of the low application rates for tribufos, it may not be possible to reduce or eliminate the risks and maintain an efficacious application level.

Based on information provided by HED, tribufos hits all of the triggers for special review based on health effects.

The following is a summary of risk for non-target organisms.

A. Avian Species

Acute Risks

Acute risks to nonendangered avian species are not likely; any potential acute risks may be mitigated by restricted use classification. For single, broadcast applications of nongranular products, risk quotients (RQs) ranged from 0.10 to 0.30. For multiple, broadcast applications of nongranular products, RQs ranged from 0.11 to 0.24.

Endangered avian species may be affected acutely, considering that such organisms may be more sensitive than nonendangered species. Further, the variation in acute oral LD50s and dietary LC50s appears to indicate a difference in sensitivity between species.

The certainty of the above assessment is moderate to high. The major factor that affects the certainty (and prevents it from being high) is the variation in response among different species in the acute oral and dietary studies. For example, in the dietary studies tribufos ranges from slightly toxic to moderately toxic to practically nontoxic depending on the species tested. This variation in response increases the uncertainty of the assessment.

Chronic Risks

Chronic risks are likely for avian species, including endangered species, for all use rates of tribufos, whether applied as a single application or as a multiple application (two applications of 0.75 lb ai/acre, applied 10 days apart). For single, broadcast applications of nongranular product, RQs ranged from 1.03 to 3.04. For multiple, broadcast applications of nongranular products, and assuming maximum expected environmental concentrations (EECs) from 164 ppm to 358 ppm, RQs ranged from 1.11 to 2.42. For multiple, broadcast applications of nongranular products, and assuming an average EEC of 196 ppm, the RQ was 1.32.

The certainty of the above assessment is low to moderate. Two factors that affect the certainty (preventing it from being higher) are: (1) the lack of a mallard duck reproduction study; and (2) application of tribufos in the fall, a time when birds are not typically breeding. However, the long persistence of tribufos in the environment (i.e., tribufos is stable to hydrolysis, photolysis, and aerobic soil metabolism; soil aerobic metabolism half-life = 745

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The certainty of the above assessment is low to moderate. Two factors that affect the certainty (preventing it from being higher) are: (1) the lack of a mallard duck reproduction study; and (2) application of tribufos in the fall, a time when birds are not typically breeding. However, the long persistence of tribufos in the environment (i.e., tribufos is stable to hydrolysis, photolysis, and aerobic soil metabolism; soil aerobic metabolism half-life = 745

days) tends to offset the second factor. These factors, therefore, lead to a conclusion that while the possibility of chronic risk exists, the probability of it occurring is difficult to assess.

B. Mammalian Species

Acute Risks

Considering the calculated RQs and the available mammalian toxicity database from HED, acute risks to small mammals, including endangered species, are likely. For single, broadcast applications of nongranular products, the RQs for herbivorous and insectivorous mammals on various food items ranged from 0.01 at an application rate of 0.75 lb ai/A to 2.23 for an application rate of 1.875 lb ai/A. For granivorous mammals, all acute RQs were $\leq$0.03. For multiple, broadcast applications of nongranular products totaling 1.50 lb ai/A, the RQs for herbivorous and insectivorous mammals on various food items ranged from 0.02 to 1.77. For granivorous mammals, all acute RQs were $\leq$0.02.

The certainty of this assessment is moderate to high. Two factors that affect this certainty and prevent it from being high are: (1) a small mammal acute dietary LC50 study, which could represent dietary effects of tribufos better than the acute oral rat LD50 study, is not available to develop an acute risk quotient; and (2) it is not known how sensitive wild mammals may be to tribufos.

Chronic Risks

Chronic risks are likely for mammalian species, including endangered species, for single and multiple applications of tribufos. Several exposure scenarios were examined, including a 21-day exposure period, which should cover the shortest gestation period for a representative small mammal such as the white-footed mouse, *Peromyscus leucopus*. Even under this scenario, and using average estimated residues, chronic risk quotients were exceeded (RQs ranged from 6.38-13.94).

The certainty of the above assessment is high because:

1. The available chronic mammalian data appear to be scientifically-sound and provide values (NOEC and LOEC) related to effects on reproductive parameters (significant increase in dead pups in F1a and F2a litters).

2. Tribufos persists in the environment, allowing for chronic exposure of mammalian species.

C. Insects

EFED has no procedures for assessing risk to nontarget insects. Results of acceptable studies are used for recommending appropriate labeling precautions.

D. Aquatic Species

These assessments are based on exposure scenarios from three states: California, representing a dry climate; Mississippi, representing a wet climate; and Texas, a mixed climate.

a) California

1. Acute risks to freshwater vertebrates and invertebrates, including endangered species, are not likely.

2. A chronic risk characterization for freshwater fish is not possible; chronic effects data are lacking. However, chronic risks for freshwater invertebrates, including endangered species, are unlikely.

3. Use of tribufos in California is not expected to impact estuarine/marine environments. Acute and chronic risks to estuarine/marine vertebrates and invertebrates, including endangered species, are not likely.

b) Texas

1. Acute risks to freshwater vertebrates, including endangered species, are not likely from use of tribufos in Texas. However, a chronic risk characterization for freshwater fish is not possible; chronic effects data are lacking.

2. Acute risks to freshwater invertebrates may be mitigated by restricted use classification; however, chronic risks to these organisms is likely. Endangered freshwater invertebrates are likely to be affected acutely and chronically.

3. Acute risks to nonendangered estuarine/marine fish are not likely; however, endangered estuarine/marine fish may be affected acutely. A chronic risk characterization for estuarine/marine fish is not possible; chronic effects data are lacking.

4. Acute and chronic risks to estuarine/marine invertebrates, including endangered species, are likely.

b) Mississippi

1. Endangered freshwater fish may be acutely affected. However, a chronic risk characterization for freshwater fish is not possible; chronic effects data are lacking.

2. Acute risks to estuarine/marine fish may be mitigated by restricted use classification. However, endangered fish may be affected acutely. A chronic risk characterization for estuarine/marine fish is not possible; chronic effects data are lacking.

3. Acute and chronic risks to freshwater and estuarine/marine invertebrates, including endangered species, are likely.

The certainty of the acute risk assessment is moderate to high. The available fish toxicity data are fairly consistent, ranging from moderately toxic to highly toxic. However, the available aquatic invertebrate toxicity data are more variable, ranging from moderately toxic to very highly toxic. This variation in response indicates differences in sensitivity between species and increases the uncertainty of the assessment preventing it from being high.

The certainty of the chronic risk assessment is moderate to high because:

1. The available chronic aquatic data appear to be scientifically-sound and provide values (NOEC and LOEC) related to effects on reproductive parameters. (Although a NOEC was not determined in the mysid life-cycle study, use of the LOEC in developing RQs still resulted in values well above the LOC of 1.0.)

2. Tribufos is likely to persist in the aquatic environment (hydrosoil) allowing for chronic exposure of aquatic species.

3. However, the absence of chronic fish studies affects the certainty and prevents it from being high.

E. Plants

The risks to nontarget terrestrial and semi-aquatic plants and to aquatic vascular plants cannot be assessed because pertinent plant studies are lacking. For aquatic nonvascular plants, risks are minimal, both for nonendangered and endangered plants. At an application rate of 1.875 lb ai/A, RQs for both plant types ranged from 0.0003-0.014.

The certainty of the risk assessment for plants is low because of the lack of pertinent terrestrial and aquatic plant data.

VII. Risk Reduction Measures

Because of the low application rates for tribufos, it may not be possible to reduce or eliminate the risks and maintain an efficacious application level.

Acute high risks appear greatest for nontarget mammals (herbivores/insectivores) and aquatic invertebrates exposed to tribufos residues. To mitigate such risks, the following are recommended:

1. Reduce rates of application wherever possible;
2. Limit use to ground sprayer applications; and
3. Restrict use to certified applicators.

Chronic risks are likely for birds, mammals, and aquatic organisms exposed to tribufos residues. However, because of the persistence of tribufos, it is difficult to determine what mitigation measures could reduce such risks. The recommendations for acute risks could be used, but it is doubtful they would eliminate chronic risks.

At this time, EFED is not recommending that monitoring of surface water drinking supply systems for tribufos or its major degradate, 1-butane sulfonic acid, be required for reregistration because:

1. Tribufos is not currently regulated under the Safe Drinking Water Act, so no MCL has been established for it and water supplies are not required to sample and analyze for it.

2. The Office of Drinking Water has not established any Health Advisory Levels (HALs) for it.

3. The relatively high soil/water partitioning of tribufos indicates that the primary treatment processes employed by most surface water supply systems to remove suspended particulates should be relatively effective in removing tribufos.

4. Neither tribufos nor 1-butane sulfonic acid are on HED's list of "Apparent Exceeders (Chronic Effects and Cancer)" contained in their report, "Pesticides Appearing to Pose Excessive Dietary Risk."

VIII. Labeling

Manufacturing Use Products

The following label statements are recommended for manufacturing use products:

This product is toxic to fish and aquatic invertebrates. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or public water unless this product is specifically identified and addressed in an

NPDES permit. Do not discharge effluent containing this product to sewer systems without previously notifying the sewage treatment plant authority. For guidance contact your State Water Board of Regional Office of the EPA.

End-Use Products

The following label statements are recommended for end-use products:

This product is toxic to fish and aquatic invertebrates. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark.

Surface-Water Advisory

If a decision is made to include on the label wording to minimize runoff, EFGWB recommends the following wording:

Tribufos can contaminate surface water through spray drift. Under some conditions, tribufos may also have a high potential for runoff into surface water (primarily via adsorption to eroding soil), for several months post-application. These include poorly draining or wet soils with readily visible slopes toward adjacent surface waters, frequently flooded areas, areas over-laying extremely shallow ground water, areas with in-field canals or ditches that drain to surface water, areas not separated from adjacent surface waters with vegetated filter strips, and highly erodible soils cultivated using poor agricultural practices such as conventional tillage and down the slope plowing.

Drinking Water Exposure:

Tier II Estimated Environmental Concentrations (EECs) for use in the human health risk assessment were calculated using PRZM2 and EXAMS II. A Tier II EEC assessment uses a single site which represents a high-end exposure scenario from pesticide use on a particular crop or non-crop use site. The meteorology and agricultural practice are simulated at the site for 36 years so that the probability of an EEC occurring at that site can be estimated.

PRZM2 simulates erosion and runoff from an agricultural field and EXAMS II simulates the fate in a surface water body. It was assumed that 5 percent of the applied tribufos reached the surface water via aerial spray drift at the time of application and that 95% of the applied chemical was deposited on the target site.

An aerial application of 1.875 lbs ai/acre liquid formulation to cotton in Mississippi was modeled. Tier II upper tenth percentile EECs are 0.014 ppm (acute - peak) and 0.005 ppm (chronic - 60 day). The EECs have been calculated so that in any given year, there is a 10% probability that the maximum average concentration of that duration in that year will equal or exceed the EEC at the site.

A quantitative assessment for ground water was not completed because tribufos, based on its environmental characteristics, is not expected to reach ground water.